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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/804,146	03/19/2004	Yu Pen Tsai	4459-141	6402

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EXAMINER	
ARORA, AJAY	
ART UNIT	PAPER NUMBER
2811	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/804,146	TSAI ET AL.	
	Examiner	Art Unit	
	Ajay K. Arora	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-6,9,10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-6, 9, 10, 12 & 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/26/2006 has been entered. An action on the RCE follows.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 2 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amended claim 2 now recites "with the printing device

being brought into contact with the dice", which is not specifically disclosed in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 3, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Peterson (US 2003/0157762), hereinafter Peterson, in view of Inaba (JP 405226484A), hereinafter Inaba.

Regarding Claim 2, Peterson discloses a method of marking wafer-level chip scale packages, the method comprising the steps of:

providing a wafer (100) having a plurality of dice (110) formed thereon, wherein the dice have been packaged into a plurality of semi-finished chip scale packages, wherein each of the semi-finished chip scale packages comprises a plurality (page 3, para 0031, 5th sentence) of terminals (114) for making external electrical connections (page 3, para 0031, last sentence), each die has a plurality of bonding pads on an active surface thereof, the bonding pads are electrically connected to the respective

terminals (page 3, para 0031, last sentence), and a backside surface of each die is exposed from a surface of the respective semi-finished chip scale package;

positioning the semi-finished chip scale packages formed on the wafer;

printing ink marks by transferring ink (page 4, para 0035, last line) from a printing device onto the exposed backside surfaces of the dice (page 3, para 0032, 1st sentence);

curing (page 4, para 0038, 2nd sentence) the ink marks on the dice; and

dicing the wafer (page 3, 0033, last sentence) to obtain a plurality of separated chip scale packages.

Peterson does not specifically disclose that the printing device is "brought into contact with the dice"; or that the curing of ink marks is done "after said printing". Inaba teaches (refer to Figure 1) a method of marking objects such as integrated circuits with ink, wherein the printing device is brought into contact with the surface to be printed, e.g. surface of the IC (9), and wherein the curing of ink marks (3c) is done after said printing (see English translation, last line of the paragraph titled "CONSTITUTION"). It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Peterson so that the printing device is brought into contact with the dice and the curing of ink marks is done after said printing. The ordinary artisan would have been motivated to modify Peterson for at least the purpose of using a simple, cost-effective device that mechanically transfers the ink to the printing

surface, where the process typically requires uncured ink to be applied and hence ink is cured after printing.

Regarding Claim 3, Peterson as modified above, teaches the method further comprising the step of removing defective ink marks after the printing step and before the curing step (page 4, para 0038, 4th sentence).

Regarding Claim 12, Peterson teaches the printing step comprises the step of applying ink (page 4, para 0035, last line) in a recognizable (page 5, para 0042, 2nd last sentence) pattern directly (page 3, para 0034, 2nd sentence and page 4, para 0035, last sentence) on the exposed backside surface of the dice to form said ink marks.

Regarding Claim 13, Peterson teaches that the printing step comprising the step of applying ink (page 4, para 0035, last sentence) in a recognizable (page 5, para 0042, 2nd last sentence) pattern indicative of an identifier of each said die directly (page 3, para 0034, 2nd sentence and page 4, para 0035, last sentence) on the exposed backside surface of the die.

Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson in view of Inaba, and further in view of Schramm (US 2004/0060910), hereinafter Schramm.

Regarding Claim 4 and 6, Peterson teaches the method as claimed in claim 2, wherein the positioning step is performed by a positioning device (page 1, para 0005, 2nd last sentence) and further teaches a printing device (page 6, para 0049, 3rd line). However, Peterson does not teach that "the positioning device and the printing device are positioned on two opposing sides of the wafer, and the printing step is performed by coaxially aligning the printing device with the positioning device".

Figure 2c of Schramm teaches a system for marking semiconductor wafers wherein the positioning device (142) and the printing device (147) are positioned on two opposing sides of the wafer (143), and the printing step is performed by coaxially aligning (along 149) the printing device with the positioning device. It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Peterson with the teachings of Schramm so that the positioning device and the printing device are positioned on two opposing sides of the wafer, and the printing step is performed by coaxially aligning the printing device with the positioning device. The ordinary artisan would have been motivated to modify Peterson for at least the purpose of improving positional accuracy.

Regarding Claim 5, Figure 2 of Peterson (page 3, para 0033, last line) teaches the wafer has a plurality of dicing streets (117) between the semi-finished chip scale packages. However, Peterson fails to teach that "the positioning step is performed by finding the dicing street with a charge coupled device (CCD)". Schramm discloses a

system for processing semiconductor wafers wherein the position step is performed by finding the dicing street (page 5, para 0078, 10th sentence) with a charge coupled device (page 5, para 0076, 1st line). It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Peterson with the teachings of Schramm so that the position step is performed by finding the dicing street with a charge coupled device (CCD). The ordinary artisan would have been motivated to modify Peterson for at least the purpose of utilizing widely available off-the-shelf positioning equipment.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson in view of Inaba, and further in view of Grigg (US 6,703,105), hereinafter Grigg.

Regarding claim 9, Peterson teaches substantially the claimed method, including that the printing step is performed by marking the backside surfaces of the dice, but does not teach that the step is performed for "all of the dice in one action". Grigg teaches a marking method for semiconductor chips, wherein the marking step may be performed for all of the dice in one action (Col. 7, lines 38-41). It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Peterson so that the printing step is performed for all of the dice in one action. The ordinary artisan would have been motivated to modify Peterson for at least the purpose of shortening the cycle time for individual chips.

Regarding claim 10, Peterson teaches substantially the claimed method, including the semi-finished chip scale packages, but does not teach that they are "positioned simultaneously". Grigg teaches a marking method for semiconductor chips/packages, wherein the chips/packages are positioned simultaneously (Col. 12, lines 47-50 and Col. 7, lines 38-41). It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the invention of Peterson so that the chip scale packages are positioned simultaneously. The ordinary artisan would have been motivated to modify Peterson for at least the purpose simultaneous printing for shortening the cycle time for individual chips.

Response to Arguments

Applicant's arguments with respect to claim 2 and its dependent claims 3, 12 and 13 have been considered but are moot in view of the new ground(s) of rejection.

On page 6-7, applicant argues with respect to claims 4-6 about "the absence of teaching or suggestion to combine Peterson with Schramm". However, applicant does not present any specific arguments why the motivation provided in the rejection is inappropriate. Therefore, it is not clear why applicant feels that there is an absence of teaching or suggestion to combine Peterson with Schramm.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ajay K. Arora whose telephone number is (571) 272-8347. The examiner can normally be reached on Mon through Fri, 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1732869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Doug K. Owens 1/8/07

DOUGLAS W. OWENS
PRIMARY EXAMINER